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The American Elm.

THE Elm-tree is dear to the heart of the New Englander. No other tree is so associated in his mind with the idea of home; it forms the most remarkable feature of the domestic New England landscape, and in no other part of the country is there a tree which occupies the same position in the affection of the people as the Elm does in that of the inhabitants of New England. The people who settled the shores of Massachusetts Bay brought with them the remembrance of the Elm-trees which were such an important and conspicuous feature in the country where they had been bred; and it is not surprising that they sought to reproduce in the new country something of the old by planting by their doors the most familiar of the English "roof trees." So the habit grew of setting an Elm-tree close by the home hewn out in the wilderness, and these house-trees, planted by the early settlers of New England or by their descendants of the early generations, are the oldest and noblest trees which have been planted by man in North America.

The American Indians were not planters of trees, but they discovered the white man's love for them, and the story is told that in Massachusetts early in the last century a party of them came to the Reverend Oliver Peabody, the pastor of Natick, and the successor of Elliott, the apostle of their race, bearing two Elm-trees on their shoulders and begging that they might be allowed to set them out before his door as emblems of friendship. The larger of these two trees was struck by lightning and destroyed ninety years afterward, when the trunk girthed twenty-one feet just above the ground. An account of these trees and of two other Elms planted by the Indians in 1753 in front of the house of Mr. Peabody's successor, the Reverend Stephen Badger, as a sign of their respect for him, appeared in the fourth volume of the *New England Farmer*, published in 1826, from the pen of Mr. John Welles.

The affection for the Elm-tree, thus early developed in the New England heart, often saved it when the land was cleared for cultivation; and when roads were made and provided with trees, as they were more generally in New England a hundred years ago than they are now, the Elm naturally was selected to shade the traveler from the burning sun of summer. The noble stem supporting the broad head of light and pendulous branches, the delicate spray, indescribably beautiful in winter, and the abundant foliage of summer, make the American Elm one of the most desirable of road-side trees when placed in a suitable situation, and a fitting ornament to stand by the stateliest mansion or the humblest farm-house.

The illustration on page 287 shows a fair example of a typical New England Elm a century old. It has been made from a photograph taken by Dr. William H. Rollins, of Boston, of a tree planted a hundred years ago in the town of Sandwich, New Hampshire. The soil in which this tree has grown is dry and rather sterile, and the tree is not an exceptionally large one for the age, the trunk girthing only twelve feet at three feet above the ground. The effect of the poor soil is already apparent, and the leaves are smaller and drop earlier in the autumn than they did ten years ago, for the American Elm will not live to a great age or develop all its beauty in every situation. It dreads drought and starves in poor soil; its home is on fertile intervales along streams, where the deep alluvial soil is never dry and where plant food is never lacking. The Elms which grew to such great size by the farm-houses of New England owed their stature to the nourishment stolen from the neighboring garden, or to the moisture drawn from the well which their branches shaded. Thus they grew to great size and lived out their span of life, which at the best is not very great, for the Elm is a fast-growing tree, and rarely lives during a longer period than two centuries or two centuries and a half. The most vigorous of them begin to show the first signs of decay before they have seen a century and a half go by, and an Elm a hundred years old in perfect health is now difficult to find, except on some exceptionally fertile river-lands like those which border the upper Connecticut. Our Elm, therefore, being so impatient of drought, and being so dependent on abundant nourishment, is not a safe tree to plant in all sorts of soils and situations, although it has long been the habit to plant it everywhere in some parts of the country. As growth and vigor diminish insects multiply; and none of our trees suffers to such an extent from their ravages. There can be no more forlorn spectacle, certainly, than the rows of half-grown, stunted Elm-trees which may be seen in our cities and their suburbs, disfigured by the canker-worm and by hordes of other insects. The Elm is one of the best of trees to plant where the soil is deep and rich and where moisture is abundant and constant; it is one of the least desirable of all trees to set by the side of city streets, where plant-food is always lacking and where moisture is quickly carried off by the artificial drainage of road-bed and service pipes. Give it a fair chance and the American Elm will hold its own against any tree in the world in its own peculiar light and graceful beauty; but, unless all the conditions favor it, there is no tree less satisfactory, and it should not be planted unless these conditions can be supplied.

North America, or the eastern half of the continent, for no Elm grows naturally in the far west, is well supplied with Elm-trees. The American Elm (*Ulmus Americana*) ranges from Newfoundland to western Texas, and from the Atlantic seaboard to the eastern base of the Rocky Mountains. The Slippery Elm (*Ulmus fulva*), dear alike to the youthful heart and to that of the purveyor of nostrums, is widely scattered over a large portion of the eastern part of the country. In the south the Wahoo (*Ulmus alata*), a much smaller tree than the American Elm, with corky branches and small foliage, grows by the banks of streams and is now often planted as a roadside tree. The Rock Elm, known to botanists as *Ulmus racemosa*, because the flowers are produced in short racemes, inhabits the western states. This is little known still to cultivators, although of much promise as an ornamental tree, and although the wood which it produces is not equaled by

that of any other Elm-tree. The Cedar Elm of Texas (*Ulmus crassifolia*), so called, perhaps, because it grows among the Junipers (*Juniperus occidentalis*), which form a prominent feature of the vegetation of some parts of western Texas, is not surpassed in grace or in beauty of habit and of lustrous foliage by many American trees. It is a tree of medium size, and as it grows naturally in dry soil, it may be expected to flourish where other Elms would not, in regions of uncertain rain-fall like some parts of southern Europe and our Pacific-coast region. Eastern America, therefore, possesses five Elms; in Europe there are three species at the most, and, according to some botanists, only two; one of these, the tree which is almost universally called the "English Elm" in this country, although curiously enough it is not an English tree at all, having been introduced into Britain by the Romans, extends through Asia to Japan, where, and in China also, another species occurs. There are, at the most, therefore, four species in the Old World, so that more than half the Elms belong to our silva.

The action of the Legislature of this state regarding forestry matters during its recent session, tends definitely in the direction of the acquisition of land in the Adirondack region by the state, and of the establishment of a large State Park, which shall include the sources of the principal streams of the state. The Forest Commission is empowered and required to investigate the subject thoroughly and to report its finding to the Legislature at its next session. This really places the whole matter directly in the hands of the people of the state for their decision. The result does not depend upon the Forest Commission, though its action is, of course, important and necessary. It does not depend, in any great measure, upon the individual judgment or preferences of the men who will be members of the next Legislature. It depends upon the intelligence, foresight and will of the people of the state, and very largely upon the expression of the people's interest and wishes regarding the matter through the press of the state during the coming summer and autumn.

These are the essential facts to be kept in view. The permanent maintenance of forest conditions over extensive mountain areas around the sources of the rivers is necessary to the commercial prosperity of the city of New York, and is important to the towns and agricultural regions of the interior of the state. The Adirondack mountain, forest and lake region has an incalculable and ever increasing value to the people of the cities of the whole country as a wilderness, a land of unviolated natural solitudes, of sylvan beauty and peace. It should be forever a matchless sanitarium, a paradise for civilized anglers and hunters, an ideal refuge for escape from the burdens of toil and the fever of life in great towns. If the people of the state have the foresight and wisdom which are essential to their own prosperity they will decree whatever action and expenditure are found to be necessary for the establishment of an adequate and permanent forest-reservation around the sources of their principal rivers.

We find the following paragraph leading the editorial column in a recent issue of *Popular Gardening*: "An English paper criticises the frequent use made of the unfortunate term 'landscape architect' by American landscape-gardeners, and thinks the word very descriptive of the formal, hateful work frequently done by them. Perhaps the criticism is not quite undeserved." We consider it altogether undeserved. Formal gardening, in the true sense of the word, as implying a symmetrical, architectural arrangement of surfaces and plantations has rarely been attempted in this country; but the few instances where such an arrangement forms a feature in a park of generally informal character—as, for instance, the Mall and terrace in the Central Park—can surely not be described as "hateful." It is probable, however, that the English critic referred to the use of such minor formal elements as stiff flower-beds and regular groups of exotic foliage-plants. Of this kind of work many hateful examples may certainly be found in America. Nevertheless, it is so far from characteristic of America that the American abroad is perpetually astounded by the sins of foreign gardeners. In England the newly developed love for hardy flowers has but added to the trouble, for one constantly sees shrubberies defaced by symmetrical rows of flowering plants placed along their borders; and instances of a purely natural treatment of lawns and plantations are now far rarer there than here. Formal gardening of the true sort is much better understood in France than with us; but formal features of the bad sort are there also much more universally introduced than here. In no European city, we can safely say, is there a park conceived in so purely naturalistic a way and kept so free from inharmonious details as the Central Park. The Thiergarten, in Berlin, by far the most beautiful park in Europe, cannot be compared with it, as this is rather a carefully tended and cultivated forest than an artificially formed and yet natural looking landscape. From end to end the Bois de Boulogne is defaced by immense flower-beds of shrieking colors, placed in the most inappropriate situations; the same is true of most portions of the large park of which the people of Lyons are so proud; and, in short, a journey through Europe, followed by one in this country, would convince the English critic that, whatever they may call themselves, our landscape-gardeners better deserve the name of artists to-day than those of any other land.

Trees in Their Spring Attire.

At this season of the year we may realize more fully perhaps than at any other how deficient our ordinary text-books are in their descriptions of trees, and what feeble pictures, after all, they supply. The reason, of course, is that for the most part the botanist sees the trees in one or two stages of their growth only, or is even often compelled to confine himself to the dried specimens in the herbarium. Moreover, so rapid is the growth at this time of the year, so fugitive the appearances presented, that unless the trees can be inspected on a particular day, some characteristics are lost till the next season. The gardener or the forester who is always on the spot, and who is, or who ought to be, always on the look out, has great advantages in these respects. A few illustrations may suffice to explain our meaning.

In Richmond Park there are two Horse Chestnuts side by side, now each in the full glory of their new leafage, and each covered with flower-buds promising an early display of bloom. The two trees are at this moment, to use a colloquialism, as like as two pins. The color and stage of growth of the foliage and flower are, in fact, alike in both. Far otherwise was it a fortnight or so ago, when the buds were beginning to expand; then, the two trees were conspicuous a long way off, the one with its ruddy brown color forming a contrast to the other with its clear green hue. The explanation of the difference was easily found in the circumstance, that the expanding bud-scales of the one tree were tipped with deep brown, or even flushed with pink, while those on the other tree were mostly green.

Again, the leaf-scales or stipules of some of the Beech-trees are of a lovely shade of crimson, while in others they are dull brown. It is, moreover, worthy of notice, that in the extension shoots, which lengthen rapidly and which bear leaves only, these stipules are often most brilliantly colored; whilst on the same tree, on the short, slow-growing "spurs" bearing the flowers, and where the internodes, as a botanist would say, are in consequence contracted, the color of the stipulary scales is dull brown. These differences make one wonder what purpose can be served by the brilliant coloration of organs whose functions would seem to be protective only, and which, once that office is fulfilled, fall off and wither immediately. The color in these stipules is presumably of the same nature as that which gives brilliancy to the leaves of the Purple and Copper Beeches. A similar color is observable in the stipules of the Lime, but we have not yet met with any purple-leaved Lime-tree.

The chemical analysis of the bud-scales, as determined by Professor Church, is quite consonant with their temporary and merely protective character. They contain relatively much earthy mineral matter, but little or none of the organic

compounds which are the accompaniments, and, indeed, the instruments of life and activity.

Another color-phase is presented by the Hornbeam; when its male catkins are first produced slightly in advance of the leaves, the whole tree is covered with a sheet of a pale olive or fawn color, quite unlike any other arboreal tint familiar to us, and one which rapidly changes as the leaves expand; notice also the peculiar olive tint of the Lombardy Poplar at this season.

Of the peculiarities presented by the developing buds of the conifers we have spoken on previous occasions. It must suffice to say that they form objects of great beauty, interesting and suggestive subjects of investigation for the student, and often afford the forester means of distinguishing one species from another. Too implicit confidence, however, must not be placed on these characteristics, for, as we write, we have before us shoots of *Pinus cembra* taken from two plants growing side by side at Coombe Wood; in the one the bud-scales and shoots are pink, in the other green. Foresters and woodmen are familiar with many variations of this character which rarely come under the observation of the botanist, but which are often of practical importance, inasmuch as they are often associated with differences in the quality of the timber and the degree of hardihood of the tree.

The general course of leaf development varies somewhat according to season and individual peculiarity. This season, in the neighborhood of London, the Sycamore, Horse Chestnut, Thorn, Hornbeam, Lime and Birch have unfolded their leaves in the order named, whilst amongst the later trees may be mentioned Oak, Ash, Elm, Beech, Plane and Sweet Chestnut.—*Gardeners' Chronicle.*

The Art of Gardening—An Historical Sketch.

XXI. The Mahometans in India.

WHEN speaking of the more ancient inhabitants of India I said that their gardening art may well have been affected, at least to some small extent, by Persian influence, for this was certainly the case in many provinces with their architecture; and in my last chapter, where the advent of the Mahometan conquerors was noted, it was pointed out that their art was distinctly based upon the art of mediæval Persia. It is indeed most interesting to see in the Mogul remains of Hindustan the sign-manual of Saracenic taste—which means a mere development of mediæval Persian taste—set on every building and garden, and no sign of that "Tartar" taste which shows in the architecture of the Chinese, a race of the same Turanian blood as the Moguls. The great mosques of Delhi are purely Saracenic in outline and feature, although their details are naturally akin to those of the neighboring Hindu monuments since they were built for the Mogul rulers by local Hindu artisans.

In one important point, however, the Turanian origin of the Moguls is evident. All peoples of Turanian blood have been great tomb-builders, owing to that peculiar form of primitive religion which prescribed the worship of ancestors. Wherever a Turanian people has flourished—whether in recent times or as the far-off predecessor of other races who have since dispossessed it—there we find a temple more like a palace than like a sanctuary in the Aryan or Semitic sense, and a tomb more like a shrine or temple than a mere place of sepulchre.

So it was in India while the Moguls ruled. A change of faith had banished ancestry-worship, but the passion for splendid tombs persisted. The Mahometan religion required the building of stately mosques, and the luxurious temperament that had developed in the once rude and warlike tribes from central Asia demanded sumptuous palaces. But the royal tombs of Mogul India surpass both mosques and palaces in interest, and they show us something which we have not found in studying the art of Mahometans of Arabian or Moorish blood.*

Architecture and gardening went hand in hand under the Moguls as they had under the old Hindu rulers. The mosque and the palace were surrounded with ornamental grounds, while as the environment of the tomb they were of peculiar importance. The usual process, writes Fergusson,† when a Mogul prince wishes to provide himself with a tomb, is now, as it was in earlier centuries, "to enclose a garden outside the city walls, generally with high crenellated walls and with one or more splendid gateways; and in the centre of this he erects a square or octagonal building, crowned by a dome, and in the more splendid examples with smaller dome-roofed apartments on four of the sides or angles, the other four being devoted to entrances. This building is generally situated on a lofty square terrace, from which radiate four broad alleys, generally with marble-paved canals ornamented with fountains; the angular spaces are planted with Cypresses and other evergreens and fruit-trees, making up one of the formal but beautiful gardens so characteristic of the East. During the life-time of the founder the central building is called a Barrah Durrie, or festal hall, and is used as a place of recreation and feasting by him and his friends. At his death its destination is changed—the founder's remains are interred beneath the central dome. Sometimes his favorite wife lies beside him; but more generally his family and relations are buried beneath collateral domes. When once used as a place of burial its vaults never again resound with festive mirth. The care of the building is handed over to priests and cadis, who gain a precarious subsistence by the sale of the fruits of the garden or the alms of those who come to visit the last resting-place of their friend or master. Perfect silence takes the place of festivity and mirth. The beauty of the surrounding objects combines with the repose of the place to produce an effect as graceful as it is appropriate."

The most famous and beautiful of these Mahometan garden-tombs of India is the Taje-Mehal, at Delhi, built for his favorite wife by Shah Jehan, who reigned from 1628 to 1658. Every traveler has described it, and the camera has made its aspect as familiar as that of the Parthenon or Notre Dame. Nevertheless, we can have no real idea how it looks, for, more than any other great building in the world, it depends for its charm upon the grouping of many different parts and the union of them all with the gardens. "If the Taje were only the tomb itself," says Fergusson, "it might be described; but the platform on which it stands, with its tall minarets, is a work of art in itself. Beyond this are two wings, one of which is a mosque which anywhere else would be considered an important building. This group of buildings forms one side of a garden-court 880 feet square; and beyond this again is an outer court, of the same width but only half the depth. This is entered by three gateways of its own, and contains in the centre of its inner wall the great gateway of the garden-court, a worthy pendant to the Taje itself. Beautiful as it is in itself, the Taje would lose half its charm if it stood alone. It is the combination of so many beauties and the perfect manner in which each is subordinated to the other that makes up a whole which never fails to impress even those who are most indifferent to the effect produced by architectural objects in general. . . . When used as a Barrah Durrie or pleasure palace it must have been the coolest and loveliest of garden retreats, and now that it is sacred to the dead it is the most graceful and impressive of the sepulchres of the world. . . . The long rows of Cypresses which line the marble paths that intersect the garden are now of venerable age, and, backed by masses of evergreen foliage, lend a charm to the whole which the founder and his children could hardly have realized. Each of the main avenues among these trees has a canal along its centre studded with marble fountains, and each vista leads to some beautiful architectural object."

The Taje is still in perfect preservation, but such is not the case with the palace at Delhi, likewise built by Shah Jehan, in which the famous peacock throne of Aurung-Zebe afterward stood, a marvel to the eyes of traveling Europeans. It formed an immense group of varied and beautiful buildings, arranged in a symmetrical, yet by no means monotonous way; and to the northward of it the gardens survive, formally disposed and filled with fountains and little pavilions and kiosks of white marble. Around the great hall of this palace was carried the famous inscription: "If there is a heaven on earth, it is this, it is this;" and even to-day, we are told, when the barbarous, "civilized" European has done much to ruin the beauty of the spot, the words sound none too boastfully. It is still approached from the town by a magnificent street nearly a mile in length with a stream of water running through the centre and rows of ancient trees on either hand.

There is no sign in these descriptions of that love for picturesqueness and variety which marks the pleasure-grounds of Granada. I should hesitate to say that none but strictly formal gardens were designed by the Moguls of India, for I have not been able to find any comprehensive account of their work in this direction. But it seems probable that a love for symmetry and regularity was stronger—or at least more universal—here than in Spain. A common religion bound the conquerors of the two countries together, and in each case we see an art which was based on Perso-Arabian precedents. But climate and landscape differed greatly, and the blood of the two races was unlike. At Granada the most typical building is a palace, at Delhi it is a tomb; if we examine the

*The Moors built no tombs in Spain, and though Saracenic sepulchres of importance exist in Persia, they cannot compare in magnificence with the Indian examples.

†"History of Indian and Eastern Architecture."

features of the two, we shall see a likeness in fundamentals, but a difference in details, and, so to say, in the general spirit of the work; this difference means a greater degree of regularity and sobriety in Delhi than in Granada; and I may say once more, as is the architecture so in every land are the gardens which accompany it. The likeness yet unlikeness of the gardens of the Moguls of Hindustan to those of the ancient inhabitants of the country on the one hand, and on the other to those of the Mahometan rulers of other countries, shows with clearness that the art of gardening, no less than its sister crafts, has a historical as well as a purely æsthetic significance.

In conclusion, I want to call attention again to the fact that among the Hindu remains of the Indian peninsula are some which show an even stronger feeling for wholly natural landscape effects than we find in Moorish Spain—approaches to rock hewn temples, for instance, composed of rough boulders and irregularly growing trees. So far as I can gather these instances are exceptional. But, however rare, they have their importance, as showing that the peninsula was akin in its mental characteristics to the further east as well as to the west—as forming a transition which leads us without a break from the classic gardens of Greece and Italy to the picturesque natural gardens of the Flowery Kingdom. *M. G. Van Rensselaer.*

Selenipedium caudatum, var. Warscewiczii.

THE noble specimen of this Orchid, which furnished the subject of the illustration on page 285, forms part of Mr. F. L. Ames' very rich collection at North Easton, Massachusetts. It is one of the most ornamental of the genus, both in its large, bold foliage, and in the handsome flower, which always strikes a person unfamiliar with the curious forms Orchid-flowers sometimes develop as one of the most remarkable objects in nature.

Selenipedium caudatum was first detected in Peru by the Spanish botanists, Ruiz & Pavon, more than a century ago, and it has been an inhabitant of European gardens for more than thirty years, having been introduced in a living state by Mr. William Lobb, who was a collector for the Veitches, and who traveled extensively in South America, where he made many important discoveries. The variety *Warscewiczii* varies from the typical plant in the deeper and brighter color of its flowers, especially of the petals and the labellum. This variety was discovered by the Polish traveler whose name it commemorates, on the mountains of Chuiqui, in Central America, where, it appears, it grows "exclusively on the tops of the highest trees at sixty or one hundred feet or more above the ground."* It is often cultivated in gardens under the name of *Cypripedium caudatum roseum*, and is by far the handsomest of the group to which it belongs.

S. caudatum is remarkable for the long, ribbon-like, pendulous petals, which, when the flower first expands, are three of four inches long, but continue growing for about ten days, at the end of which they are sometimes two feet or more long. Veitch, in his manual of Orchidaceous plants, records the fact that, from the second to the seventh day, they have been observed to have increased in length as much as two inches each day, and that flowers have been noticed in which the total length of the petals exceeded thirty inches. This plant is also remarkable for the large size of the flowers, the upper sepal being sometimes six or seven inches long, and for the handsome markings of the lip, which is bronze-green, with the enfolded lobes ivory white, spotted with purple inside the brown or yellow-brown border which surrounds the aperture.

We are indebted to Mr. William Robinson, who has charge of Mr. Ames' Orchids, for the following memorandum of cultivation employed to develop this fine specimen, which is probably the largest in the United States:

"To grow and flower this variety with success the temperature of a Cattleya-house is needed. It should be kept well up to the light, but at all times shaded from direct sunlight. A good time to repot is immediately after the flowering period, and the compost should consist of equal parts good, fibrous peat and live sphagnum moss well mixed with a sprinkling of broken charcoal. As the roots grow vigorously provision should be made for their development. The pot or pan should be proportioned to size of plant and condition of the roots, which, before potting, should be carefully examined, and all dead or decaying parts removed, with all exhausted material from the ball of the plant.

"A strong, vigorous plant does not require so much drainage as one in less healthy condition, but this is a matter which should always be carefully attended to. Fill the pot from half to three-quarters full of clean, broken crocks, with a few pieces of charcoal, and keep the base of the plant at the level of the top of the pot, and with a hard pointed stick fill in the compost well and firmly among the roots. The plant loves moisture, and at no time should it be allowed to get dry at the roots, particularly during the growing season. Syringing overhead twice a day during the summer is none too often, provided the house can be well ventilated."

* *Gardeners' Chronicle*, xx. (1883), 722.

Foreign Correspondence.

Letter from Haarlem.

HAARLEM, the centre of the Dutch bulb trade, is not only favored with a genial climate, where extremities in heat during summer, or great cold in winter, very seldom occur, but it possesses a soil which can be adapted to the cultivation of plants from regions widely differing from it and from each other in climate and in the quality of their soils. Strangers are always surprised when told what plants can be induced to thrive with us on one and the same piece of ground. Thus luxuriant specimens of your American bog plants like Cypripediums and various moisture-loving Lilies can be shown within a few yards from such drought and sun-loving subjects as the groups of central Asiatic Irises are well known to be. I attribute this to the excellent method for which our Dutch government has long been famous in carefully regulating at all times the supply of water in our many canals and rivers, and to the nature of our light, porous, sandy soil, which, though barren and sunburnt its surface may appear during summer, always remains equally moist and cool a few inches below the upper soil. Now by shading and more or less deep planting an almost endless diversity of conditions can easily be made; bulbs which require a thorough roasting and basking in the summer's sun are only covered with one or two inches of soil, while Sparaxis and Ixias, for example, the bulbs of which are rather impatient of even a very moderate degree of freezing, are planted deeply and very late in the season. They are in this way obliged to make their underground growth during the winter months, and are thus prevented from pushing up their tender shoots too early in spring. By careful shading a degree of moisture can be provided for the plants not by any means equaling the quantities of water contained in an American swampy tract of land, it is true, but still just enough for the well being of the respective plants.

One of the most striking examples of what I have just said may be found in the culture we so very successfully carry out of that group of Irises to which the botanic authorities have applied the collective heading of Oncocyclus, and of which the Mourning Iris (*I. Susiana*) is one of the oldest and best known representatives. Travelers tell us that the Irises belonging to this group are found in some of the world's most arid countries, where an excessive heat and drought reign in summer, while during winter a degree of cold is registered which we here in our moist Holland never experience. The ground in the countries where the Irises are found becomes covered with a thick sheet of snow early in winter, and under this natural cover the tender rhizomes are happily protected, until the warm rays of the suddenly returning spring melt in a few days the winter's snow and the tracts of land which only a few weeks before seemed shrouded in death become everywhere studded and crowded with the loveliest flowers imaginable. In Holland and the greater part of northwestern Europe, however, nothing can be more capricious than the ordinary winter's weather. January last the thermometer often went up to fifty and fifty-five degrees Fahrenheit, while in March it sunk as low as to ten degrees Fahrenheit. In consequence of this many bulbs which had appeared above ground in the course of January and February had their tops completely frozen off. This did not matter much to the greater part of the bulbs in general, but to Irises of the Oncocyclus group, had they not been specially treated, it would have caused an irreparable damage, if not absolute death. The method followed here to prevent these Irises from running into leaf-growth too early is the following: The rhizomes are not planted earlier than about the beginning of December, and as soon as freezing weather sets in a thick layer of reeds or leaves is applied in order to prevent the frost from penetrating into the soil. The plants are thus making their roots during the dangerous winter months, and the new growths do not appear above ground before the middle of April, when they can grow on without fear of any check.

Within the last few years some very beautiful species have been added to this group of Irises, *I. Gatesii* and *I. lupina*

taking the lead among them. Of *I. lupina* I have now several plants in full flower and I have no scruple in pronouncing them to be among the most striking of this section. The entire flower is of a greenish yellow color, delicately veined with brownish black, the centre of the lip marked with a very conspicuous black blotch. *Iris Gatesii* has flowers the shape of *I. Susiana*, but of a larger size and of a peculiar silvery yellowish gray color. It has also the decided advantage of being much hardier than *I. Susiana*. Among older introduced species *I. paradoxa* well deserves the epithet of wonderful, no other Iris flower presenting the same singular combination of colors and exquisite shape. It is a native of the southern parts of the Caucasus, and although it has long been in cultivation it is still extremely rare in European gardens. The standard segments of the flowers of *I. Iberica*, which may without exaggeration be called gigantic in comparison with the miniature size of the plant, are of a silvery white color only just perceptibly veined with a delicate lilac; the falls are very large, marked with reddish brown on a yellow ground, and adorned with a very conspicuous deep brown eye in the centre. The crossing of this with *I. Susiana* has probably given birth to the forms known in gardens under the names of *I. Iberica*, *I. Van Houtteana*, *I. insignis*, *I. ochracea* and others.

Haarlem, Holland. *C. G. Van Tubergen.*

Fig. 41.—Selenipedium caudatum, var. Warscewiczii.—See page 284.

Cultural Department.

Notes on Shrubs.

WHEREVER the native Redbud Judas-tree (*Cercis Canadensis*) and the Chinese species (*C. Chinensis*, or *C. Japonica*, as it is sometimes called) are equally hardy under all circumstances, there can be no hesitation in selecting the exotic species as the finest of the two when in bloom. The flowers are about twice the size of those of our native species, and are produced in fully as great profusion, and the color is of a finer deep reddish purple. But unfortunately the introduced species has not yet proved hardy enough in Massachusetts

to encourage many attempts to cultivate it. However, there are plants about Boston, in exceptionally favorable situations, which have become good bushes, from eight to ten feet high, and annually produce an abundant crop of blossoms, which first open about the same time as those of our native species, usually between the 10th and 15th of May. Although *C. Canadensis* is not found growing wild in New England, it is perfectly hardy when grown from seed from its northern limits in Pennsylvania or Michigan, and it is possible that the Chinese species may prove equally enduring if grown from seed from its extreme northern range in China or Japan. When planted against a background of evergreens, or among the white flowering Crab-apples, which bloom at the same time, the leafless, flower-covered branches of the Redbud make a striking and beautiful effect.

The Redbuds are among the earliest woody plants of the Pea family to flower, but they find their contemporaries in the bright yellow-flowered Siberian Caraganas or Pea-trees (*Caragana arborescens* and *C. frutescens*). The first of these sometimes attains the size of a small tree. The pinnate, light-green, downy leaves are well expanded when the solitary short stemmed yellow flowers appear, so that the blossoms are not nearly so conspicuous as those of the Redbud, but they continue a little later in bloom. There are several described natural varieties and horticultural forms of *C. arborescens*, which differ chiefly in habit of growth or size of flowers, foliage, etc., but they do not present variation enough to make it worth while to grow them in a small garden. *C. frutescens* differs chiefly in being much more shrubby and slender in habit, and having only two pairs of leaflets, which are crowded at the end of the leaf-stalk. The early fruiting of these two species testifies to their adaptation to the short summers of the northern countries where they grow. The pods ripen about the end of the first week of July, and within a few days after maturity they burst open and scatter the small dark brown peas, which swell and germinate at once if they come in contact with moist soil. *C. Chamlagu* is a small shrub, of Chinese origin, which has slender branches, and large yellow flowers, which become reddish as they get old. It does not appear to be a very profuse flowering plant in this latitude, and it is not nearly as hardy as the preceding species. *C. Altagana* is a slender, graceful little plant, with very small leaves, having the general appearance of a miniature form of *C. arborescens*.

Nearly all of the Caraganas possess more or less developed stipular spines at the bases of the leaves. In most of the species they are short, but in *C. jubata* they are long and slender, and in *C. spinosa* they seem to reach the greatest length and sharpness. On the last species they are from one to two inches in length, and, though slender, are remarkably rigid, and capable of penetration. Being a native of Siberia and northern China, the plant is quite hardy. The flowers are yellow, as in almost all species of the genus. The leaves and branchlets are covered with a grayish down, and as the long spines extend far beyond the foliage, they give the whole plant an ashy colored appearance which is more curious than ornamental.

Arnold Arboretum. *J. G. J.*

Fern Notes.

A VERY useful arrangement of Ferns may be made and a beautiful effect produced by planting out a number of species on a bench, a rock-work or other suitable place, and in this way, too, an abundant supply of fronds can be secured for cut-flower work. This last is an important item in most places, and by the adoption of the above system a larger and better supply may be had from a given space than if the plants were grown in pots. This has been abundantly proved in commercial establishments where the growing of Fern fronds for the market is now a special feature, though largely confined to a single species, *Adiantum cuneatum*, which is grown by tens of thousands for this purpose. But on many private places the amount of space available for such a purpose is quite limited, and consequently a variety of fronds will be found more useful. At the same time this particular Maidenhair Fern must be placed at the head of the list as the most generally useful Fern now in cultivation, and this being the case, of course a larger proportion of this species should be planted than of either of the others hereafter named.

A. gracillimum is also good, its finely divided pinnæ being so graceful and filmy in appearance as to excite the warmest admiration when used among certain flowers. *A. Wiegandii*, a garden variety of American origin, is also an excellent sort for cutting, the fronds being of medium size, and when well matured lasting for several days in water. *A. Williamsii* and *A. hispidulum* are also to be classed among the useful Maidenhairs, both being very effective and having lasting qualities.

Onychium Japonicum should be included in the list, its slender, light green fronds being quite durable.

Several members of the Pteris family should have a prominent place, being among the most free-growing and easiest raised of Ferns. Their seedlings appear in almost all directions in a house that has been used for these plants for a few months. Probably the best of the Pteris for cutting are to be found among the varieties of *P. Cretica* and *P. serrulata; P. Cretica magnifica, P. Cretica albo-lineata, P. serrulata* and *P. serrulata cristata* being among the best. If the space at hand will permit, some of the larger sorts should be added, such as *P. tremula, P. argyræa* and *P. semi-pinnata*, as foliage of this description is very useful in large decorations.

Some of the Nephrolepis should also find a place, their long, graceful fronds being especially elegant when tastefully used among well-grouped flowers. *N. davallioides furcans, N. rufescens tripinnatifida* and *N. pectinata* are notably good, while the whole genus is pretty.

Davallia tenuifolia stricta and *Nephrodium otarium* (otherwise known as *Lastrea aristata variegata*) are also good Ferns for this purpose, though the last named is rather slower in growth than the preceding.

This short list may serve as a basis for an operation of this character, though numerous additions will soon suggest themselves to the interested cultivator.

The treatment to be given is very simple, the usual method being to fill a bench to the depth of five or six inches with soil —a light loam will answer, or, if the soil is inclined to be clayey, a third part of peat may be added and also some sand. It is best that the soil be not made too light by the addition of much peat, else the fronds are likely to be too soft for cutting, and in filling up the bench, of course, proper provision should be made for drainage; and while a reasonable degree of shade is necessary, yet the house should not be made as dark as some Fern-houses are, or the result will be soft, flabby fronds, that wither almost as soon as they are cut.

Young, vigorous plants, from three or four inch pots, will be found most satisfactory, and, if planted out now, will soon become established and will furnish a large number of fronds during the following autumn and winter if planted in a house in which a temperature of fifty to fifty-five degrees is maintained.

Probably the most troublesome pest to which these plants are exposed is that of slugs and snails, by which the young fronds are eaten off as they appear; and an easy way to obviate this difficulty is by laying some leaves of cabbage or lettuce on the soil, and by the examination of these leaves in the morning and evening many such vermin may be destroyed.

Holmesburg, Pa. *W. H. Taplin.*

Some American Plants.

ONE of the prettiest Brodiæas we have seen came from Oregon under the name of *B. Hendersoni*. Its flowers, six to twelve, are in an umbel three-quarters of an inch wide, creamy white with a yellowish centre. A prominent dark purple stripe runs the whole length of the sepals both outside and inside. The leaves are from the base, long and narrow, and the naked stem is about a foot high. It would be useful for cutting.

Another showy little plant is the *Allium serratum*, from California. It is about ten inches high, with a naked stem and a many flowered umbel of rose-purple flowers half an inch wide. Like our *A. tricoccum* the leaves die down at time of blooming, leaving only the flower-stalk visible. It may not be hardy. Ours were covered with leaves during winter.

Calochortus pulchellas, now in bloom, has pretty nodding yellow flowers an inch wide, on short stems. The plant is low, only four to six inches high, bearing in succession two to five flowers. It is not suitable for bouquets, but is well worth growing as a garden plant. It probably needs protection in winter.

Zygadenus elegans, one of the Lily family, is a rare plant occasionally found along the northern portion of the United States from New York to Oregon, and along the St. Lawrence River to the Gulf. It varies much in height. Our plants from Oregon are only a foot high, but we have seen it on the lower St. Lawrence much taller. Its leaves are long and grass-like from the bulbous root. The naked stem bears a single panicle of from eight to fifteen erect white flowers, with a greenish yellow centre, three-fourths of an inch wide. It is pretty and useful for cutting, hardy, too, and should become better known in cultivation.

The common Wild Lupine (*Lupinus perennis*) is a very

American Elm-tree at Sandwich, New Hampshire, 100 years old.—See page 281.

pretty plant in flower. Its loose spikes of pale blue and purple flowers of various shades are often more than a foot in length by an inch and a half thick, on stems long enough for cutting. It is very common in some localities, growing luxuriantly in the poorest sandy soil—a desirable perennial a foot and a half high.

The little Star Grass (*Hypoxis erecta*) makes a pretty border plant, and grows much stronger in cultivation. Its narrow leaves are a third taller than its flowering stems. The numerous bright yellow flowers are three-fourths of an inch wide. It will grow in shade or sun, and is perfectly hardy.

Cynthia Virginica, a plant of the Dandelion family, is a foot and a half high, bearing on long, almost naked stems, two to five yellow flowers an inch wide, which closely resemble those of small Dandelions. They open in the warmest part of the day and close at night. The most of its leaves are at the base of the plant. It is found on moist banks in New York State and westward. It is easily cultivated, and may be grown in a thin shade or open sunlight.

Claytonia parviflora, though of the same genus as the Spring Beauties, is an Oregon species and flowers much later. Indeed, both of our species (*C. Virginica* and *C. Caroliniana*) have usually nearly died down before this begins to flower. Its flowers, however, much resemble those of its eastern relatives, but are a trifle paler, and are more numerous, on longer stems, and come from a tufted root, while ours are both from small tubers. It is a hardy plant, forming dense beds, and when in full bloom displays almost a solid mass of pale pink flowers. It needs a thin shade.

Baptisia leucophæa (False Indigo) is an interesting plant of the Pulse family. Its height is about a foot, and its divergent branches make it broader than it is tall. Its long drooping racemes of cream-colored flowers are very pretty. These racemes are often a foot in length, and each flower raised on a long pedicel is itself nearly an inch in length. It is a native of the western states, and should have a light soil in open sunlight.

Geranium maculatum (Wild Crane's-bill) and *G. Robertianum* (Herb Robert), two common eastern species, are in flower. The former is a much taller plant, with light purple flowers three-fourths of an inch wide, quite pretty, but not very durable, on ample stems for cutting. The latter is a strong-scented plant, scarcely half as high, with smaller red-purple flowers, which appear from the last of May until the middle of autumn. It is a pretty plant for rockeries. Both species like shade.

Geranium incisum, from Oregon, is also a pretty species, with rose-purple flowers, with darker stripes, an inch wide. The plant is usually about a foot high, is hardy, and well worth growing.

Southwick, Mass. *F. H. Horsford.*

Hardy Plants for Cut Flowers.

THE Japan Anemones are usually classed among hardy perennials, though they are not reliably hardy in all sections. Even when covered in the open ground the strong flowering buds often get killed during severe winters, and by far the best plan is to lift the roots after the foliage has been killed by frost, and place them in boxes of soil in a cool cellar until spring, when they may be replanted in well-enriched soil. During dry weather the plants should be abundantly supplied with water, and they will be very different from the specimens of this queen of autumn blooming plants which are too often seen in our gardens. The type is the earliest to flower, and has bright, rose colored, semi-double flowers, which are very bright and pleasing, but the habit of the plant is poor in comparison to the pure white form known as Honorine Joubert, which is the best and most useful. The variety *hybrida* has pink flowers, and the three make a very interesting group for the flower border, and if a plant or two of *Aconitum autumnale* be planted with the Anemones it will give a beautiful dark panicle of flowers at the same time, and a group of these plants will be sure to attract attention in September and October. When lifting the Anemones, if it is desired to increase the stock (and one feels that it is hardly possible to have too much), the smaller fibrous roots may be carefully lifted and potted up, and if kept in a greenhouse during winter and grown on they will flower well the next fall.

During a favorable season the Aconitum ripens seed in fall, and this germinates readily if sown as soon as gathered, in striking contrast to imported seed of this genus. A collection of seventeen kinds of these foreign seeds was sown at the same time last fall, but not one of the seeds germinated. It should be remarked that *Aconitum autumnale* is perfectly hardy, and is better without protection, as this induces it to grow early in spring, when late frosts are still prevalent.

The Sunflowers are a beautiful genus, and nearly all the perennials are late summer blooming plants. *Helianthus multiflorus* is the one most common in gardens, especially the double variety; it only needs liberal treatment to bring an abundance of useful flowers in fall. It must be admitted that, though often called hardy, this is not absolutely true, and it is best to lift an old root and place in the cellar with the Tritomas, Anemones, Gladiolus, Dahlias, and such plants, that are indispensable, though tender. *H. angustifolius* is an elegant species, growing about four feet high, with much-branched flower-stems and deep green, shining leaves, and produces an abundance of flowers similar to those of Coreopsis and quite as useful for cutting. A colony of this plant is admirable in any place where it may be planted and left alone to take care of itself, as it seeds freely and soon becomes naturalized, and though old plants are liable to perish in winter the young ones are ready to take their places. *H. orgyalis* and *H. Maximiliani* are two species that flower late, grow tall, have graceful foliage, and may be used for cutting when few other flowers except Asters are to be found. They are both strong growers and need plenty of rich material to feed on, and this may be applied to the best advantage if the plants are lifted early in spring and replanted at once. This little trouble will be amply repaid by the vigorous growth the plants make, especially as the foliage is so pretty all the summer as a background to other plants that they are worth growing for this alone.

It is scarcely necessary to say anything about *Coreopsis lanceolata* except, perhaps, that it is the best hardy yellow Composite grown, and no one with a garden can afford to be without it, and, indeed, never will if it is once planted; for it seeds so freely and the birds are so fond of the ripe seed that wherever the Coreopsis is grown it is sure to become naturalized, as we have often seen it among long grass, in fields, near gardens where plants were growing. Last summer we attempted to gather seed, but the birds captured the lion's share in spite of all precautions. *Coreopsis tripteris* should have been classed with *Helianthus orgyalis*, it grows so tall. It has graceful foliage, and very fragrant flowers, which smell like the English Wallflower, and they are acceptable for house decoration in the latter part of September.

Reading, Mass. *E. O. Orpet.*

Papaver lævigatum.—Another season's trial of this variety confirms the favorable impression formed on its introduction last year. It is now profusely in bloom on some self-sown seedlings. The flowers are cupped, some four inches in diameter and of a very deep rich crimson, or, perhaps, blood-red, with black blotches on each petal; and it is with some satisfaction to be noted that they hold their own against the flaunting Oriental Poppies. The latter, with their beautiful Acanthus-like foliage and noble flowers, are among the best of herbaceous plants, but the vivid orange-scarlet flowers fairly overpower most other blooms in a garden, and care is necessary in planting them, so that they are far removed from any blue-reds especially, as the contrast is hideous. The new rose colored form will be valuable, as it might be planted in positions where the type would be inadmissible. Nature has favored us with entirely too many "blue-reds," as a collector of hardy plants discovers, especially among Phloxes, Pæonies, Aubrietias, Pyrethrums and Primulas, and great care should be exercised in planting these in a general collection where the orange-reds are in the same field of vision. Colors appear so differently to various observers that it is difficult to say which may not be pleasing to the average grower, but it would seem that the washed-out blue-reds might be banished from every garden. The deeper color, the rosy purple of the florists, is, perhaps, more admissible, but not satisfactory to every one.

Ornithogalum Arabicum is an old inhabitant of gardens, but until lately it has been comparatively little grown. It is often called Star of Bethlehem, although this name is properly applied to *O. umbellatum*. The flowers now in bloom in the open are very attractive, forming clusters of a dozen on long peduncles. Separately, they are about two inches in diameter, pure white, with a curious black ball-like eye. The bulbs, which may be secured in the fall, are not quite hardy with me, but, potted up, are kept in the cold frame and plunged in the open on the approach of warm weather. The bulbs have been sold largely for forcing, but, judging from some results seen, they do not seem reliable for that purpose. *O. nutans* is a somewhat striking contrast to above, being hardy and prolific of increase. The flowers of this variety are green, striped white, star-shaped, and bloom in a loose raceme. It comes very rapidly into bloom in the first warm days of April, and the flowers are rather fugacious, opening first on the lower part of the scape. It is a native of southern Europe, and has lately been found in Asia Minor.

Columbines are scarcely exceeded in grace and beauty by any family of hardy plants, and it is almost superfluous to dwell on their value for small and large gardens. From the earliest, *Aquilegia Sibirica*, to the latest, *A. chrysantha*, there is a long season of bloom, and in most soils the plants are long-lived. They naturalize well in semi-wild places, and even hold their own in not too dense grass. While the blooms are not very lasting, they are good as cut flowers for a couple of days. Cut with long stems, and with their foliage arranged at the base, they make graceful bouquets. Stock is readily increased from seed, from which they bloom the second year. If special varieties are desired, seed should be secured from very reliable source, as the flowers are very attractive to insects, and it is impossible to secure reliable seed where varieties are cultivated together. Where one is not very particular a German "assortment" such as is offered by the seedsmen will produce an endless variety.

Aquilegia dichlora, from Portugal, is now in bloom. As its name implies, this is a two-colored variety, the sepals being a turbid light purple, with white-tipped petals; flowers medium size and spurs about one inch long. The plant is about two feet high; foliage small and triternate. This variety is not sufficiently attractive for ordinary garden purposes.

Aquilegia alba grandiflora, Munstead variety, is a fine dwarf growing White Columbine, with charming cream-white flowers of a rather delicate texture. Spurs are an inch long and foliage light green and attractive.

Elizabeth, N. J. *G.*

Sowing Seed.—Seeds of herbaceous Calceolarias, Cinerarias and Chinese Primulas should be sown at once thinly on fine soil, and not covered with soil. A good way to treat these seeds and seedlings in the summer-time is to select a north-eastern exposure under the lee of a building where a small platform can be erected about a foot from the ground. In this the seed-boxes are set. These are covered over with paper first, over which panes of glass are placed, and over all is a glass roof made of ordinary hot bed sash. This gives control of light, air and moisture at all times.

Ten Weeks Stocks.—At this moment I have a fine display of these most beautiful and deliciously scented flowers. The seed was sown on March 15th; when large enough the plants were pricked out in boxes one and one-half inches apart, transferred to cold frames and on the first week in May they were planted fifteen inches apart in soil that was well manured last year for potatoes. In transplanting, none but those showing double flowers were planted. The colors are red, white, purple, and a buff or chamois shade. They are from twelve to eighteen inches high, with several spikes to each plant. Gladiolus will be planted among the Stocks about the 15th of June so as to keep the bed occupied.

Pearl River, N. Y. *John Thorpe.*

Correspondence.

The Fruit Outlook.

To the Editor of GARDEN AND FOREST:

Sir.—The crop predictions now current in the papers are generally most flattering. The business prospects of the country are cheering, the farmers and fruit-growers are congratulated on the promise of a bountiful harvest. The motives behind these inspiring forecasts are various, but they do not, as a rule, emanate from practical farmers themselves. It is a common practice among superficial observers to conclude that an abundant bloom is a sure forerunner of a bountiful crop. I have heard several persons remark this season on the full bloom of fruit trees, that it was bearing year, and there would be a full crop of all fruits except peaches. But the practical cultivator, while he knows that blossoms must precede fruit, also knows that these appearances are often deceitful.

There is probably no fruit crop so subject to the caprices of temperature and climate as the Peach. The mild, late fall of last year sent the trees into winter quarters full of fruit buds, but winter was a continuation of autumn. This mild and genial weather aroused the dormant buds and caused them to swell beyond their ability to withstand a low temperature. Peach-blossoms in December and January are not calculated to stand severe weather, and when these were met by the cold waves in the Carolinas and Virginia they were an easy prey, and the swelled, though unopened buds in Maryland and Delaware were largely killed. The fact that a few buds escaped on some of the late varieties was due to their more dormant condition, probably, than to their more hardy nature. When I announced the loss of the crop here I was told that the condition of things was probably not as bad as I thought, and there would be more peaches than expected. Since then these confiding ones have changed their views, and have concluded to do without peaches this year.

Of the other standard fruits the bloom was unusually abundant, never more so; some trees were complete masses of flowers, with hardly a green leaf visible. Years of observation have taught me that superabundant blossoms are not sure indications of a full crop of fruit, but on the contrary quite often result in a light crop. Ordinarily if one blossom in ten sets a fruit that arrives at maturity the crop will be abundant. This season, if one blossom out of a thousand produces fruit I shall be disappointed. The cause or causes that are responsible for such unexpected results are not altogether clear.

Possibly the trees in attempting to produce an extraordinary amount of pollen have had their ability overtaxed so as to be unable to impart to it the vigor necessary for the effective fertilization. An excess of moisture in the form of rain or fog will also seriously interfere with this work. I think, however, a low temperature is a more potent agency in preventing fructification than is generally suspected, and is really the responsible factor even if the atmosphere is clear and dry and bees are as active in making their accustomed visits.

It is to this cause, perhaps, that we owe the loss of our fruits this season; at all events fruit-growers in this part of New Jersey need not study the markets as sellers or count on much income from their Apple, Pear or Cherry crop.

Of the small fruits Currants are about half set. Strawberries promise well for a full crop now. Grapes are not yet in bloom here, hence it is too early to speculate in regard to them, and both Strawberries and Grapes have yet to incur the chances of attacks by insects and fungi. These fictitious forecasts are detrimental to the producer and consumer alike as far as their influence extends, and their publication ought to be discouraged. An honest, truthful statement of the condition of crops as they develop, rather than speculative theories in advance, would be far better for all concerned.

Montclair, N. J. *E. Williams.*

The American Association of Nurserymen.

Fifteenth Annual Meeting.

THIS meeting was held in the hall of the Park Avenue Hotel, in this city, and its sessions occupied three days last week. About two hundred members were in attendance, and all sections of the country were represented. An admirable programme had been prepared by the Secretary, Mr. Charles A. Green, of Rochester, and carefully written papers were followed by animated and instructive discussion. The President, Mr. G. A. Sweet, of Dansville, New York, took a somewhat discouraging view of the immediate prospects of the nursery business, and he declared that no other industry employing the same capital and labor has been so poorly paid during the last fifteen years. The individual members, however, did not seem to be in a gloomy frame of mind, and altogether one rarely sees a representative body of business men whose appearance indicates greater prosperity. Mr. Sweet himself seemed to express the general sentiment when he said later that while the large profits which came to a new business in a new country can no longer be realized, there is no reason why the nursery business should not stand abreast of other legitimate industries and realize a fair return for capital and labor invested. The hope was expressed that since the Association had accomplished so much in securing equitable rates for freight, expressage and postage, something further might be accomplished in the way of combination against adventurers who demoralized the market by planting for temporary speculation. Mr. Sweet wisely added that it was for the interest of nurserymen to help on every movement which opened new markets for fruit, new appliances for safe transportation and new processes for preserving fruits, as well as to encourage the production of new varieties of fruit which would prolong the season, and to aid in increasing the general knowledge of trees and shrubs, and promoting the public taste for ornamental planting.

Among the subjects considered was the method of securing to the originators of new fruits and plants some

certain reward for their labors. The plan of a National Plant Register, as developed by Mr. A. L. Bancroft, of San Francisco, was considered too cumbersome, but some mode of registering new plants seemed desirable and a committee was appointed to consider the subject. Some of the members explained that they already used trade-marks under existing laws, and that this practice protected them to a great extent.

We give abstracts of some of the addresses, and these will be continued next week.

GRAPES AS AFFECTED BY CLIMATE AND SITUATION.

This was the subject of a paper by Mr. George W. Campbell, of Delaware, Ohio, well known as the introducer of the Delaware Grape. The greater portion of the essay is herewith given.

The widely differing opinions upon the character and value of our most popular Grapes seem at first sight unaccountable. And although much may be due to the diversities of individual taste, the different estimates upon many of our Grapes from different sections of the country can hardly be satisfactorily referred to this cause alone. I have in mind the conflicting reports which I have seen upon the southern seedlings of the Riparia class—mostly from the Taylor and Elvira—which was introduced from Missouri with high commendation. Also upon the so-called hybrid varieties of Messrs. Rogers, Ricketts, Moore and others. I may also include special varieties of more recent date; notably Niagara, Empire State and Pocklington; as well as Brighton, Eaton, Woodruff Red, to say nothing of many more of less prominence.

Within my own experience, all the Riparia seedlings, such as Elvira, Missouri Riesling, Grein's Golden, and several others known by numbers, with Faith, Amber and Noah, have failed, in my locality, to meet expectations. While their habits of growth, hardiness, health and productiveness are generally good, they are decidedly wanting in the quality to render them acceptable for general use. Still, I do not feel warranted in saying that because this is my experience the same varieties may not be, in their native home, under the more genial influences of a southern sun, all that their introducers claimed, and valuable acquisitions to their list of native Grapes.

The various reports which we have of the Pocklington, Empire State and Niagara indicate to me simply this—that in some places and under favorable circumstances they are successfully grown and valuable—while in others, to which they are not adapted, or from some unfortunate surroundings, they are not. During the past season, in my reading of one day, I saw reports upon the Pocklington from two different sources—one praising it as a Grape of remarkable excellence, the other finding it so poor that he wanted to prosecute the nurseryman who sold it to him for a fraud.

Nearly as diverse have been the reports upon the Empire State. In some places it has apparently sustained the high character claimed by its introducers, in others it is reported to have failed both in the health and hardiness of the vine and in the quality of its fruit. In my locality the Empire State has been healthy in foliage, vigorous in growth, and—excepting in the past season, when it failed to ripen perfectly—the finest in quality and flavor of any white Grape I grow. In this instance the vines were probably allowed to overbear, and a cool, rainy autumn prevented their maturity.

The Niagara has sustained itself fairly well—though it will not endure our severe winters without protection. It is not as early as was represented—unless it is gathered long before it is ripe and while it is both immature and foxy—but if left upon the vine until well ripened it is a really good grape, retaining but little of the foxy taste or odor. My experience with the Niagara indicates that in localities to which it is adapted it will prove a valuable and profitable variety. The same remarks will apply to the Woodruff Red, except that the latter has proven, so far as tested, healthy in fruit and foliage, and entirely hardy in our severest winters. I still regard the Woodruff as probably the most promising red Grape for general planting yet introduced.

Of Mr. Rogers' many varieties, I will mention but one as bearing upon the points I wish to illustrate. His Number One or Goethe was introduced as a light or amber-colored Grape; and in Massachusetts, I presume, it rarely attains a deeper color. At Delaware, where I have grown it for more than thirty years, it sometimes obtains a light red or pink shade; but was always flavorless and insipid, with the exception of a single instance, when the autumn was unusually warm, and the ripening season prolonged until about the middle of October. It then attained a color as dark as the Delaware and a high flavor and good quality hitherto unknown, thus showing that farther south, where the skies are brighter and the seasons longer, it might be a valuable Grape. This, I believe, is just what many of our southern growers find it; and the Elvira, with its kindred varieties and seedlings, are no doubt equally improved under the same favorable conditions.

Mr. Ricketts' Grapes, although many of them, as grown and exhibited by himself, were of great beauty and excellence, have not proven generally successful, and the most of them, I think, can only be grown to perfection by special care or in very favorable situations. The Jefferson has been with me one of the most successful, and among the best flavored, though sometimes rather tardy in ripening. John Snider, one of the oldest Grape-growers in southern Ohio, at Lancaster, gives the Jefferson the position of "the finest grape on the American Continent." But Secretary Williams, of New Jersey, finds the Jefferson unsatisfactory and of little or no value.

The Brighton Grape is deservedly popular in many places, but it often fails in productiveness. This must always continue, for the cause is found in its imperfect blossom, with short filaments and reflexed stamens. In favorable seasons, with bright and mild weather during the period of inflorescence, the pollen seems sufficient to fertilize and produce perfect fruit. But if cold and rainy weather prevails at this period the grapes fail to set, and few and imperfect clusters are the result. Some of the Rogers' Hybrids and the newly-introduced Moyer Grape are in the same class.

Most persons who plant a large number of different kinds of Grapes come to the conclusion that we have too many varieties. This is doubtless true as applied to any one locality; but the very kinds that do not succeed in that particular situation may be both successful and valuable in other places which are suited to their special requirements. Many of us have doubtless observed that occasionally, when we have pleasant and sunny weather extending late into autumn without unseasonable frosts or cold rains, some of the Grapes of southern origin, such as Catawba and Herbemont, and even our northern Clinton and Zoe, become rich and high flavored with a sweetness and refreshing sprightliness which are only attained in our climate in exceptionally favorable seasons, or on southern walls, or in sheltered and protected situations where they have artificially the climate and the surroundings which their origin and their nature require. The inference here is plain that in other places where such favorable conditions exist naturally the same happy results will as naturally follow.

I have probably said enough to indicate the point I wish to make: that success in Grape culture requires that varieties should be selected which are specially adapted to the locality where they are grown; and that because a Grape does not succeed in one section, it is by no means certain that it may not be both successful and valuable in another to which it is fitted naturally. I regard this matter of adaptation as one of the most important to be considered by the practical Grape-grower.

The area of adaptation is evidently much wider for some varieties than others. In our section of country the Labrusca type—including Concord, Worden, Moore's Early, Ives, Lady Martha and Woodruff—will probably be found more generally successful than any other class; but there are, doubtless, in some portions of the south, other varieties which are better adapted to their soil and climate than any of these. The Delaware Grape would probably be found adapted to as large an area as any other in cultivation, except for its unfortunate liability to mildew of the foliage; and I am not without hope that the use of the sulphate of copper remedies may so far overcome this difficulty as to permit the successful growing of this valuable variety to an extent even beyond that of the Concord by reason of its constitutional resistance to the attacks of Grape-rot.

I regard as of the greatest importance the use of these recently discovered remedies against the various maladies which have been so prevalent and so discouraging to Grape-growers. I believe that their general adoption and general use will not only greatly enlarge the area of successful Grape-growing, but will also enable us to grow profitably many of the finer and partially tender varieties in sections where it would be impossible without them.

SUCCESS WITH PEACHES.

Mr. J. H. Hale gave his experience in growing Peaches north of what is generally considered the Peach region—his home being in central Connecticut. He had observed that on high hills seedling Peach-trees lived and flourished, while trees in the valleys, which were cultivated, almost invariably, were killed in the winter or had their buds killed so as to destroy all hope of fruit. He, therefore, began an experiment in a small way, and planted some peach-pits from Tennessee.

He started his orchard on the high hills, taking pains that the ground should slope away rapidly, because he had observed that the cold air flowed down into the valley as rapidly as water would; never planting his trees on elevated plateaus, but on the steep ridges. He took pains to cultivate the soil thoroughly, and, having seen that in the neighborhood, trees which stood in land which had been enriched heavily with stable manure were short lived, he determined to make a trial of commercial fertilizers. He began to plant on thin land, using different kinds of chemical fertilizers, until he found that wherever he used potash and bone-dust his trees did well. He used no nitrogenous fertilizers except the little which was found in the bone, for he discovered that the trees which were fertilized with nitrogen, although they made a rank growth, died young. Six years ago his orchard had grown to fifty-two acres in a region where the mercury sometimes descends to twenty degrees below zero.

He prunes closely, and prunes so as to assist in thinning the fruit; that is, he does not begin to use the knife until after the trees have bloomed and begun to set their fruit, but he also thins very thoroughly afterward. In one orchard last year, after having thinned the fruit to one-half, he set men to work with orders to pick four peaches to every one they left, and as a result he had nothing but fine, large fruit. He took care to see that the fruit was picked carefully, and since his market was near by, every peach was allowed to mature fully. The peaches were very carefully assorted by women of taste and judgment, and among the first quality nothing but the very select and large and perfect fruit was gathered and carefully packed in new baskets made of white poplar, and pains were taken to have every peach from bottom to top of the same quality, with a label and guarantee to this effect, and then he asked a dollar more a basket than other sellers asked for fruit that looked as well on the top as his. Last year he picked 17,000 baskets. The best sold at wholesale from $2.50 to $3.50 a basket, the second grade at $1.65 to $2.25, and so on down to the lowest quality, and he received for his entire crop $25,000.

Mr. Hale was asked whether his success had not ruined his neighbors, and he replied that, to the best of his belief, at least 100,000 Peach-trees had been sold in Connecticut this year, and although every one was guaranteed to be of the same sort as those that Hale planted, he suspects that 90,000 of them will die and very few of the rest will yield paying crops. He observed that so long as he bought trees from other dealers he found some trees of the wrong sort mixed in the row; and as they came from honest growers, he concluded that the mistake arose from propagating from trees which were standing in the nursery rows. In this way errors were perpetuated. If buds were invariably taken from bearing trees there could be no mistake.

THE VALUE OF PIECE-ROOT GRAFTING AS COMPARED WITH CROWN GRAFTING AND BUDDING.

Professor L. H. Bailey, of Cornell University, said that in no country but our own is nursery stock largely propagated by piece-root grafting. The advantages of this method are, that more trees can be made from a given stock; that it cheapens the multiplication of trees; that a given number of trees can be produced more quickly; that, with deep planting, cions of hardy stock will throw out roots of their own and preserve a tree even if the original root was tender. Of course, all varieties, when grafted, do not root equally well, but it is possible in this way to get what are practically own-rooted trees, for example, of the Chicasa Plum when grafted on the Peach. In this way piece-roots are good for temporary stock, as when the Quince is grafted on the Apple. Besides this, it enables us to grow rare plants of which we have no seeds or cuttings. What seem to be some disadvantages of this form of grafting are that the roots always grow more pronged and not so deep; fewer fine roots are thrown out, and most of them start on one side; trees from such stock (it is said) are more liable to blow over, and Professor Bailey cited as examples two contiguous orchards, one of crown grafted trees and the other of trees from root-grafts, in which it seemed clear that the latter needed staking more firmly in order to keep them upright. As a rule, root-grafted trees make a smaller growth, and Professor Bailey exhibited some photographs which seem to show that two-year-old budded trees were as large as three-year-old root-grafted trees. Professor Bailey explained, however, that these pictures were not conclusive evidence, since they were not grown by the same persons and for several other reasons. Again, root-grafted trees tend to be more crotched and straggly in the top. It is also said that they are not so long lived.

The advantages of crown grafting on whole roots or budding are that larger trees with deeper and more symmetrical roots are secured; that the young trees have greater force behind them in a more perfect root system so that they are more vigorous and growthy. It is argued also that the crown is the best place to graft because it has a more dense tissue than the root and probably therefore will make a more perfect union.

Mr. Albaugh, of Ohio, enforced the views of Professor Bailey by saying that in the experience of his company, which is very large, they have lately succeeded in getting more and better trees from crown grafts, so that they think the method is preferable both for the nurseryman and planter. At all events they never have any block of trees failing utterly, as they formerly did when they used root grafts.

A nurseryman from Nebraska declared that the question was a sectional one; that in the east, where a very strong growth was needed, whole roots were the best, but in the deep, rich soil of the west these long, strong growths failed to ripen up, and in consequence winter killed. Therefore, root grafting was the best in the west because such plants only grew to a moderate size and ripened well to the tip. He also never had found any lack of lateral roots and the trees from root grafts stood as stiffly as any others.

NEW VARIETIES OF FRUITS.

Mr. H. E. Van Deman, pomologist of the Department of Agriculture, delivered an informal address upon this topic, from which we make some extracts:

Many good varieties of Plums had come, he said, from *Prunus Americana*, which extends all through our north and northwest regions. Among the newer varieties, the Hawkeye, from Iowa, is the best. It is the largest and most beautiful, although it is late, ripening six weeks after the ordinary Plum season. Cheney, from Minnesota, is another plum of medium size, very early, of a deep crimson color, but not so good as the Hawkeye when it is cooked. Ludlow is flat in shape, large, productive and of very pleasant flavor. Rollingstone is small, of a purplish red color, handsome and well-flavored. Leduc is a very pretty, small, yellow plum, originating in Minnesota. It is very productive and sweet, and will be valuable for a dessert fruit. Hopp is of medium size, dark, solid and very sweet. Clyman is a variety of *Prunus domestica*, and is as early as the Wild Goose, six weeks earlier than the ordinary Plums of this class. It sets full of fruit, and will probably be hardy in the middle states.

Among the Japanese plums, Botan is said to be hardy enough to ripen as far north as Connecticut. In shape it resembles the Kelsey. Ogon is yellow, nearly round, and as large as the Wild Goose. Kelsey is very large, three inches in diameter, purplish, heart-shaped; but it will not fruit north of Tennessee. Burbank is of medium size, crimson-purple in color, exceedingly beautiful, rich in flavor, and it will perhaps prove hardy in the middle states. Satsuma is smaller than Kelsey, but as large as the common plums. It is round, with dark red flesh and a small stone. One disadvantage of all Japanese Plums is that they bloom so early their blossoms are liable be be caught by the frost, as in the case of the Apricot. They all hold their foliage well, and this fits them to the vicissitudes of our very trying climate.

Of the newer Pears, the Krull, originating in Missouri, seems to be the best of winter Pears. It surpasses the Lawrence in quality and color. The Idaho has not been overrated as to quality, but as yet we have no warrant for believing that it is superior in hardiness to many others.

Among Apples, the Garfield, originating in northern Illinois, seems to be hardy in that trying region. It is not so large as Ben Davis. It has a brilliant crimson stripe on a yellow ground, rich and handsome in appearance and fair in quality. Lacon is of about the same quality, yellowish, and its hardiness would seem to warrant trying it in the northwest. Shirk originated in Indiana. It is very sweet and of a high color. The tree is a fine grower, and it is an excellent fall sweet apple, and hangs well on the tree. Bullman has been widely advertised, but it seems to be a synonym for the Red Canada. The Peffer is a seedling of Pewaukee and is very promising. It is of medium size, red, white fleshed, a natural seedling, and is very hardy. The Foundling is an old variety of New England origin, which has been strangely overlooked until late years. It is quite hardy in the northern part of New England; very pretty, with red stripes on a yellow ground, and keeps late into the winter.

Of Strawberries the only new variety spoken of was Pearl, which is said to be one of the best, with berries of good size and held well above the ground on strong stems. It seems adapted to different kinds of soils.

Among nuts mention was made of many good varieties of our wild Chestnut, some of which are of excellent quality. One named Dupont, from Delaware, is very large. A rich tree often yielded nuts to the value of $30 and $50 a year.

The Paragon, which has been sent out by Engle & Son, of Marietta, Pennsylvania, is larger yet, four or five times as large as the ordinary Chestnut. It bears enormously and at an early age. It is not quite so well flavored as the finest of the small Chestnuts, but it is of purely native origin and well worthy of cultivation.

Of the newer Grapes, the Lyon, originating in Michigan, was reported of fine quality. The vine is very vigorous; the clusters are of the Catawba shape, although the berries are smaller. Colrain, which is probably a seedling of the Concord, is a variety larger in bunch and berry than Martha, and earlier. The vine is stronger and as healthy as the Concord.

Mr. Campbell, in reply to the inquiry as to whether its skin was too tender for shipment, stated that it was no more tender than that of the Worden. The Woodruff Red has proved itself a rampant grower and very productive. It is not of the finest quality and has a rather thick skin, but it is an excellent popular market variety. Green Mountain is a strong vine, very fruitful and is probably the earliest white Grape of good quality. It is rather small in berry, however.

The Crandall Currant is a variety of the Missouri Currant and the largest of the wild varieties. It originated in Kansas and has the merit of being proof against the attacks of the Currant-worm. Nor do the leaves fall as they do from many other varieties of Currant from some unknown fungus growth.

Notes.

Peaches from California are now coming into market here, and so are the sour "English" Cherries from the south.

Le Jardin, commenting upon the poisonous properties of *Primula obconica*, says that the common European Primrose will irritate and burn the lips if bitten.

It is announced in some Oregon papers that an excellent syrup, clear and well flavored, has been made from the sap of the Vine Maple (*Acer circinatum*).

Magnolia hypoleuca is just coming into bloom. Remarkably beautiful flowers of this species and of *M. parviflora* were shown at the Nurserymen's Convention last week by Mr. S. B. Parsons.

Professor Oliver, after a connection of thirty years with the herbarium of the Royal Gardens at Kew, of which for many years he has been the curator, retires from office. He is, however, to continue to reside at Kew, and will continue to edit Hooker's "Icones Plantarum," in which the most important and interesting of the new plants received at the Kew herbarium are figured and described.

The statement is made in an interesting article on the forests of Roumania, recently published in the *Revue des Eaux et Forêts*, that the American Locust-tree (*Robinia Pseudacacia*) has been used with great success in that country in holding the shifting sand at several places along the banks of the Danube, and that during the last five or six years twelve or fifteen thousand acres have been covered with plantations of this tree for this purpose.

There is wisdom as well as charity in the following words spoken by Mrs. Helen V. Austin at a recent meeting of the New Jersey Horticultural Society: "We are often told that if fruit-trees were planted in the street the boys would get the fruit. That would be one great object in thus planting, so that the boys and girls could get the fruit. The fact is that children are starving for fruit; and what with the scarcity of the article and the enclosures surrounding what there is, the average boy is forced into being a thief."

The *Revue Horticole*, quoting from the *Botanisch Jaarbock*, calls attention to the results of a curious series of experiments lately made in the Botanical Garden of Ghent for the purpose of determining whether the seeds which germinate the most rapidly produce the most vigorous plants, and whether, in the case of the Gilliflower, as had been affirmed by Dr. Nobbe, the plants which germinate first produce a larger proportion of double flowers than those in which the germination had been retarded. It appears that these experiments confirm the truth of the assertion. Such experiments, to be at all conclusive, must, of course, be repeated over and over again and on a very large scale; still, as Monsieur André suggests, they may be of immense horticultural significance.

The May issue of the *Bulletin of Miscellaneous Information* from the Royal Gardens at Kew contains correspondence on Lagos rubber, the product of the West African *Ficus Vogelii*; on a new Mealy Bug which has proved a troublesome and destructive pest among cultivated plants in Egypt, with a description and figure of the insect (*Crossotosoma Ægyptiacum*); on the machines used in the manufacture of hemp in the Mauritius, and on the Siberian perennial flax, about the use of which the authorities of Kew have endeavored to obtain some information in the hope that it might prove a substitute for the common Flax, which is an annual and therefore has to be raised from seed every year. The perennial Flax has numerous wiry, slender stems about one or two feet high. Many attempts have been made to utilize this plant for fibre and in the production of linseed oil, and it was supposed that it had been used for this purpose in Siberia. The correspondence, however, which Mr. Morris' inquiries have brought out, seems to show that it is doubtful if Flax on a commercial scale is anywhere produced except from the annual species.

The American Agriculturist for June gives an interesting account of the cultivation of Lima Beans in Ventura County, California, where the crop brings something like half a million dollars. The seed is planted in May by machines, which drill in three or four rows at a time. The plants are cultivated once or twice and never irrigated. No poles are used, but the vines cover hundreds of acres, clinging close to the ground like a green carpet. In August, when the beans are ripe, a V-shaped knife, with blades five or six feet long, and attached to a wooden sled, is drawn by three horses, which are guided between the rows by one man. Two rows are cut at once, and four men are kept busy raking the loosened vines into heaps to dry. Twenty acres are cut in a day. Three or four weeks are required to properly dry the beans, which are then run through a thresher, and the straw is stacked, to be used later as fodder for cattle and sheep. The average yield of Limas is 1,800 pounds to the acre, and these are worth $44 at wholesale. A liberal estimate for expenses, including seed, planting, cultivating, cutting and harvesting, is $8, leaving a profit of $36 to the acre.

It is well known that the larvæ of the May-bug or Dor-bug do an immense amount of damage by eating the young roots of grasses, Strawberry and other delicate rooted plants. In France, especially, their ravages have resulted in great losses, and energetic attempts to destroy them are made. The destruction of these beetles is a matter of such importance that a word, "Hannetonnage," has been coined to express the action of hunting them. It appears, according to the *Revue Horticole*, that during the year 1889 the Department of Seine-et-Marne paid no less than 113,000 francs in prizes for the destruction of the beetles, which were collected to the amount of more than 500,000 pounds. They are trapped by suspending lights over shallow vessels of water. The beetles fly against the glass covering of the lamps and drop into the water below, and are then collected and destroyed. The experiment has been tried in this country with success, and it is worth doing on a large scale wherever these insects abound. As the presence of the larvæ is not known until the damage which they inflict is completed, the only way to attack them is to trap the beetles. A little kerosene-oil poured on the water placed in the vessels into which they are intended to fall will deprive them of all chance of escape.

It is well known that the practice of removing the flower-stems of Hyacinths and Tulips just as the spikes have attained full development prevails in all the bulb-farms of Holland. The general opinion is that there is but one object in view in depriving the plants of their beauty at its zenith—namely, to save the plants the strain of ripening seed, and to aid the development of the bulbs by the power thus conserved being devoted solely to them. It is recently stated, however, by a correspondent of the *Journal of Horticulture*, that one of the largest growers and exporters at Haarlem gives another explanation of the custom. The specific object of removing the flowers of Hyacinths and Tulips is, he says, to prevent the petals falling upon the leaves, which occasions spotting, commonly called "fire." When the foliage becomes thus affected its powers of assimilation and elaboration are materially curtailed, and the bulbs are greatly weakened. The strain of ripening seed is so small a consideration that in the case of Crocuses and Narcissi, which do not become "fired" by the falling flowers, it is not thought worth while to sacrifice the time necessary for removing the latter, and they are consequently allowed to fall. The manner of removing the flowers is merely a matter of convenience. Hyacinth spikes are cut off; Tulips, the stems of which are brittle, are broken with the fingers and thumb.